AMENDMENTS TO THE CLAIMS

1. (previously presented) A method for reproducing a signal of a desired profile, for use in processing digitally sampled signals in a receiver, the method comprising the steps of:

demodulating received signals in the receiver, to derive a periodic code signal;

generating in the receiver a local clock signal used to provide signal sampling pulses separated by sampling intervals;

determining a frequency difference between the local clock signal and the received signals;

adjusting the local clock signal to compensate for the frequency difference;

deriving from the frequency difference a code phase value that provides a measure of a sub-sample code phase difference between the sampling pulses and the received signals; and

using the sub-sample code phase difference to reproduce a desired signal that is precisely synchronized with the received signals.

2. (currently amended) The method as ~~defined~~ claimed in claim 1, wherein the step of using the sub-sample code phase difference includes:

determining a signal magnitude for each of a succession of time values as determined from the occurrence of sampling pulses and the sub-sample code phase difference; and

outputting a succession of magnitudes to provide the desired signal profile.

3. (currently amended) The method as ~~defined~~ claimed in claim 1, wherein:

the desired signal defines a weighted time window; and

the method further comprises the step of applying the weighted time window to the received signals, to detect a signal event expected to occur within the weighted time window.

4. (currently amended) The method as ~~defined~~ claimed in claim 2, wherein:

the desired signal defines a weighted time window; and

the method further comprises the step of applying the weighted time window to the received signals, to detect a signal event expected to occur within the weighted time window.

5. (currently amended) The method as ~~defined~~ claimed in claim 4, wherein the step of determining a signal magnitude for each of a succession of time values provides a time window that is weighted to optimize signal event detection for a particular communication channel through which the signals are received.

6. (currently amended) ~~The~~ A method for generating a desired signal that is synchronized with respect to a signal event in a received, periodic, digitally sampled signal, the method comprising the steps of:

generating sample clock signals at sample intervals occurring at a sampling clock rate that is nominally an integral multiple of a rate at which signal events occur in a received periodic signal, but which ~~cannot be~~ are not exactly synchronized with the received periodic signal;

generating sub-sample clock signals;

deriving from the sub-sample clock signals a measure of clock phase within each sample interval; and

generating the desired signal synchronized with the received signal event to an accuracy level ~~limited only by~~ based on the sub-sample clock signals.

7. (currently amended) The method as ~~defined~~ claimed in claim 6, wherein the step of generating the desired signal includes:

generating a succession of signal magnitudes at times determined by the sub-sample clock signals, to provide a desired signal profile.

8. (currently amended) The method as ~~defined~~ claimed in claim 6, wherein the step of deriving a measure of clock phase includes the steps of:

applying the sub-sample clock signals to a counter;

resetting the counter with the sample clock signals; and

using the counter value as the measure of clock phase.

9. (currently amended) ~~The~~ A method for generating a weighted signal window of a desired profile in a ~~GPS~~ receiver that digitally samples received periodic signals, the method comprising the steps of:

demodulating received signals in the ~~GPS~~ receiver, to derive a periodic ~~GPS~~ code sequence;

generating in the receiver a local clock signal used to provide signal sampling pulses separated by sampling intervals and to generate other timing signals;

generating in the receiver a local periodic ~~GPS~~ code sequence similar to the one received,

at a code rate determined in part by the local clock signal and nominally the same as a received code rate;

determining in the receiver a frequency difference between the received ~~GPS~~ code rate and the locally generated ~~GPS~~ code rate;

applying the frequency difference to the locally generated ~~GPS~~ code rate to provide an adjusted locally generated ~~GPS~~ code rate;

deriving from the frequency difference a code phase value indicative of the code phase within a code rate period; and

using the code phase value to generate the weighted signal window that is synchronized with a desired signal event in the received ~~GPS~~ code sequence.

10. (currently amended) The method as ~~defined~~ claimed in claim 9, wherein:

the step of applying the frequency difference to the locally generated ~~GPS~~ code includes dividing the frequency difference by a selected value, using a counter to provide an output signal whenever the counter overflows, to indicate that the frequency difference has resulted in a cumulative phase error equivalent to a ~~whole~~ code rate period; and

the step of deriving a code phase value includes multiplying the code rate period by the ratio of the current counter contents to a ~~full~~ counter value.

11. (currently amended) The method as ~~defined~~ claimed in claim 10, wherein the step of using the code phase value to generate the weighted signal window includes:

generating a succession of signal ~~value~~ values of selected magnitudes, at times precisely

determined from the code phase ~~values~~ value, wherein the signal window is synchronized with a received signal event and has a desired profile.

12. (currently amended) The method as ~~defined~~ claimed in claim 11, wherein:

the desired ~~window~~ profile of said signal window is selected to mitigate multipath effects.

13. (currently amended) The method as ~~defined~~ claimed in claim 11, wherein:

the desired ~~window~~ profile of said signal window is selected for optimal detection of a signal pulse after the received signals have passed through a communication channel of limited bandwidth.

14. (currently amended) In a receiver that processes digitally sampled signals, an apparatus for reproducing a signal of a desired profile, the apparatus comprising:

a demodulator connected to receive signals in the receiver, and to derive a periodic code signal;

a local clock signal generator used to provide signal sampling pulses separated by sampling intervals;

a frequency differencing circuit, for determining a frequency difference between local clock signals and received signals;

means for adjusting the local clock ~~signal~~ signals to compensate for the frequency difference;

means for deriving from the frequency difference a code phase value that provides a

measure of a sub-sample code phase difference between the sampling pulses and the received ~~code~~ signals; and

a signal generator using the sub-sample code phase difference to reproduce a desired signal that is precisely synchronized with the received ~~code~~ signals.

15. (currently amended) The apparatus as ~~defined~~ <u>claimed</u> in claim 14, wherein the signal generator using the sub-sample code phase difference includes:

means for determining a signal magnitude for each of a succession of time values as determined from the occurrence of sampling pulses and the sub-sample code phase difference ~~values~~; and

means for outputting a succession of magnitudes to provide the desired-signal ~~profile~~.

16. (currently amended) The apparatus as ~~defined~~ <u>claimed</u> in claim 14, wherein:

the desired signal defines a weighted time window; and

the apparatus further comprises means for applying the weighted time window to the received signals, to detect a signal event expected to occur within the weighted time window.

17. (currently amended) The apparatus as ~~defined~~ <u>claimed</u> in claim 15, wherein:

the desired signal defines a weighted time window; and

the apparatus further comprises means for applying the weighted time window to the received signals, to detect a signal event expected to occur within the weighted time window.

18. (currently amended) The apparatus as ~~defined~~ claimed in claim 17, wherein the means for determining a signal magnitude for each of a succession of time values provides a time window that is weighted to optimize signal event detection for a particular communication channel through which the signals are received.

19. (currently amended) An apparatus for generating a desired signal that is synchronized with respect to a signal event in a received, periodic, digitally sampled signal, the apparatus comprising:

a sample clock signal generator, generating sample clock signals at sample intervals occurring at a sampling clock rate that is nominally an integral multiple of a rate at which signal events occur in a received periodic signal, but which ~~cannot be~~ are not exactly synchronized with the received periodic signal;

a sub-sample clock signal generator for generating sub-sample clock signals;

a unit for deriving from the sub-sample clock signals a measure of clock phase within each sample interval; and

a unit for generating the desired signal synchronized with the received signal ~~event to an accuracy level limited only by~~ based on the sub-sample clock signals.

20. (currently amended) The apparatus as ~~defined~~ claimed in claim 19, wherein the unit for generating the desired signal includes:

a unit for generating a succession of signal magnitudes at times determined by the sub-sample clock signals, to provide a desired signal profile.

21. (currently amended) The apparatus as ~~defined~~ claimed in claim 19, wherein the unit for deriving a measure of clock phase includes:

a unit for applying the sub-sample clock signals to a counter;

a unit for resetting the counter with the sample clock signals; and

a unit for using the counter value as the measure of clock phase.

22. (previously presented) An apparatus for generating a weighted signal window of a desired profile in a GPS receiver that digitally samples received periodic signals, the apparatus comprising:

a demodulator, for demodulating received signals in the GPS receiver, to derive a periodic GPS code sequence;

a local clock generator, for generating a local clock signal used to provide signal sampling pulses separated by sampling intervals and to provide other timing signals in the receiver;

a local periodic GPS code generator, for generating in the receiver a local periodic GPS code sequence similar to the one received, at a code rate determined in part by the local clock signal and nominally the same as a received code rate;

a circuit for determining a frequency difference between the received GPS code rate and the locally generated GPS code rate;

an adjustable divider circuit for applying the frequency difference to the locally generated GPS code rate, to provide an adjusted locally generated GPS code rate;

a counter circuit for deriving from the frequency difference a code phase value indicative

of the code phase within a code rate period; and

a signal window generator that uses the code phase value as a measure of time, and generates the weighted signal window that is synchronized with a desired signal event in the received GPS code sequence.

23. (currently amended) The apparatus as ~~defined~~ claimed in claim 22, wherein:

the counter circuit for deriving the code phase value divides the frequency difference by a selected value and provides an output signal whenever the counter overflows, to indicate that the frequency difference has resulted in a cumulative phase error equivalent to a whole code rate period, wherein this output signal is coupled to the adjustable divider circuit; and

the apparatus further comprises a code phase generation circuit, for multiplying the code rate period by the ratio of the current counter contents to a full counter value.

24. (currently amended) The apparatus as ~~defined~~ claimed in claim 22, wherein the signal window generator includes:

a unit for generating a succession of signal values of selected magnitudes, at times precisely determined from the code phase value, wherein the signal window is synchronized with a received signal event and has a desired profile.

25. (currently amended) The apparatus as ~~defined~~ claimed in claim 24, wherein:

the signal window generator provides a desired window profile selected to mitigate multipath effects.

26. (currently amended) The apparatus as ~~defined~~ claimed in claim 24, wherein:

the signal window generator provides a desired window profile selected for optimal detection of a signal pulse after the received signals have passed through a communication channel of limited bandwidth.